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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/046,080	01/16/2002	Yukio Nishimura	5988-037-27	2436

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EXAMINER

THORNTON, YVETTE C

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/046,080

Applicant(s)

NISHIMURA ET AL.

Examiner

Yvette C. Thornton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This is written in reference to application number 10/046080 filed on January 16, 2002 and published as US 2002/0132181 A1 on September 19, 2002.

Response to Amendment

1. Claim 12 has been amended. Claims 1-14 are currently pending.
2. The amendment to claim 12 is sufficient to overcome the rejection of the claim under 35 USC 112.

Priority

3. The translation of foreign priority document(s) JP 10005/2001 has (have) been entered and fully considered.

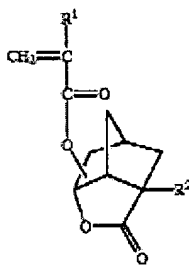
Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

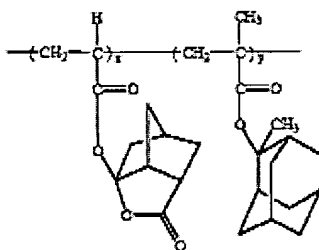
5. Claims 1-11 and 14 are rejected under 35 U.S.C. 103(a) as being obvious over Maeda et al. (US 2001/0026901 A1) in view of Suwa et al. (US 6187504 B1). Maeda teaches a photoresist material comprising at least a polymer composed by copolymerizing (meth)acrylate derivative represented by formula (1) with polymeric compounds and a

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photoacid generator (p. 0013).

(1) Example 10 exemplifies the synthesis of



a polymer having the structure:

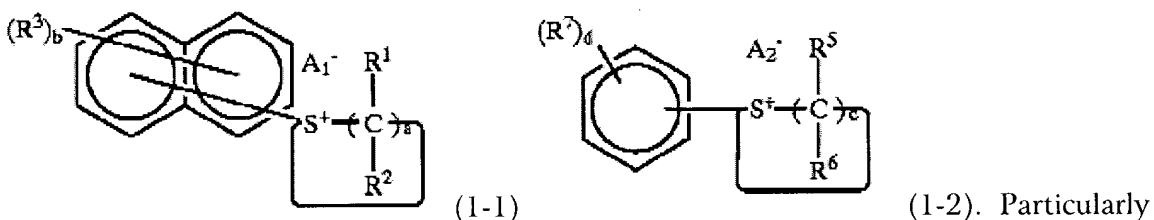
(p. 0068-0069). A photoacid

generator which can be used in the taught invention is suitably a photoacid generator which can generate an acid by irradiation of a light of 400 nm or less, and any photo-acid generator is acceptable as long as a mixture of the photoacid generator and the taught polymer can be dissolved in an organic solvent. Suitable examples include onium salts, 2,6-dinitrobenzyl esters and sulfosuccinimide compounds (p. 0043-0045). Typical examples of the solvent include, but are not limited to propylene glycol monoethyl ether acetate, methyl 3-methoxypropionate, ethyl 3-methoxypropionate, cyclohexanone, and 1,4-dioxane (p. 0048). Maeda further teaches that if necessary, other additives may be added to the taught material. Examples include organic bases, surface active agents, dyestuff, basic additives, stabilizers, applicable improvers and dyes (p. 0049). The said organic base meets the limitation of an acid diffusion controller.

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Maeda however fails to teach the use of a photoacid generator of the claimed formula (3). Maeda does teach that any photo-acid generator is acceptable as long as a mixture of the photoacid generator and the taught polymer can be dissolved in an organic solvent.

Suwa teaches the use of a photoacid generator represented by formula (1-1) or (1-2):



preferred examples of the taught photoacid generators include 4-n-butoxy-1-naphthyltetrahydrothiophenium trifluoromethanesulfonate, 4-methoxy-1-naphthyltetrahydrothiophenium n-nonafluorobutanesulfonate and 4-n-butoxy-1-naphthyltetrahydrothiophenium n-nonafluorobutanesulfonate (c. 7, l. 24-38; c. 31, l. 35-47). Additional examples include 4-methoxy-1-naphthyltetrahydrothiophenium trifluoromethanesulfonate and 3-hydroxy-1-phenyltetrahydrothiophenium trifluoromethanesulfonate (c. 4, l. 29-c. 7, l. 23). Suwa further teaches that the photoacid generators represented by (1-1) or (1-2) can be used in combination with other acid generators such as onium salts, halogen-containing compounds, sulfone compounds and sulfonic acid compounds (c. 7, l. 43-c. 9, l. 21).

One of ordinary skill in the art would have been motivated by the teaching of Maeda to use any conventional photoacid generator in the taught composition. It is the examiner's position that Suwa teaches what is conventional in the art. One of ordinary skill in the art would have been motivated to use a photoacid generator such as those taught by Suwa in the

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composition of Maeda comprising the preferred polymer of example 10 in order to form a composition which exhibits high sensitivity, and high resolution and is capable of producing fine pattern configuration (see Suwa c. 2, l. 1-10).

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al. (US 2001/0026901 A1) in view of Suwa et al. (US 6187504 B1) as applied to claims 1-11 and 14 above, and further in view of Choi (US 6045970 A). Maeda in view of Suwa teach all the limitations of the instant claims except it fails to explicitly discuss the use of a nitrogen containing organic compound. Maeda does however teach that if necessary, other additives may be added to the taught material. Examples include organic bases, surface active agents, dyestuff, basic additives, stabilizers, applicable improvers and dyes (p. 0049).

Suwa teaches that an organic base in a photoresist composition prevents a decrease in critical size of the pattern after exposure, caused by acid diffusing from an exposed portion of the photoresist to an unexposed portion. Suitable examples include triethylamine, triisobutylamine, diethanolamine and triethanolamine (c. 4, l. 23-31). One of ordinary skill in the art would have been motivated to use triethylamine, triisobutylamine, diethanolamine or triethanolamine as the taught organic base of Maeda in order to prevent a decrease in critical size of the pattern after exposure as it is well known in the art.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al. (US 2001/0026901 A1) in view of Suwa et al. (US 6187504 B1) as applied to claims 1-11 and 14 above, and further in view of Ito (US 6093517 A). Maeda in view of Suwa teach all the limitations of the instant claims except it fails to explicitly discuss the use of a alicyclic additive having an acid-dissociable group. Maeda does however teach that if necessary, other

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additives may be added to the taught material. Examples include organic bases, surface active agents, dyestuff, basic additives, stabilizers, applicable improvers and dyes (p. 0049).

Ito teaches that acid sensitive dissolution inhibitors (i.e., stabilizers) are used in conventional photoresist composition to facilitate dissolution after exposure. Examples include t-butyl cholate, t-butyl lithocholate and t-butyl ursocholate (c. 2, l. 37-57). One of ordinary skill in the art would have been motivated to use t-butyl cholate, t-butyl lithocholate and t-butyl ursocholate as the taught stabilizer of Maeda in order to facilitate dissolution after exposure as it is well known in the art.

Response to Arguments

8. The translation of foreign priority document(s) JP 10005/2001 is sufficient to perfect the foreign priority date of January 18, 2001 and therefore overcome the rejection of claims 1-14 over Nishimura (US 2002/0009668 A1) under 35 USC 102(e).

9. Applicant's arguments filed December 30, 2003 have been fully considered but they are not persuasive. Applicants argue that the specification contains evidence of non-obviousness, which distinguishes the claimed invention from the references cited in the previous Office Action. Applicants specifically refer to Table 3 of the specification, which reports data for examples 1-12 and comparative example 1. The examiner however is unconvinced. The examiner is unable to make a direct comparison between the examples of the specification and the comparative example. For example, example 1 comprises a resin (A-1); acid generators (B-1) and (b-2); acid diffusion controller (C-1); and solvent (E-1). Comparative example 1 comprises resin (a-1); acid generator (b-1); acid diffusion controller (C-1) {in a different amount than in said example 1}; additive (D-1); and solvent (E-1). The

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examiner was unable to make a direct comparison because there were too many variants.

The resin, acid generator, amount of acid diffusion controller and additive are each different in example 1 and the comparative example. There is no way to evaluate what parameter is influencing the unexpected or surprising results. Further, examples 1-12 of the specification use the preferred embodiments, which may give enhanced results.

10. The examiner notes that Resin (A-1) of the specification is structurally analogous to the taught resin of example 10 of Maeda. However the comparative results fail to show how adding an acid generator outside the scope of the preferred resin would affect radiation transmittance, sensitivity and resolution.

11. Applicants refer to Table 9 of Maeda and Table 2 of Suwa. However the examiner is unable to make a direct comparison between the examples of the specification and the cited art, for the same reasons discussed above. A better comparison would be to make the composition of example 10 of Maeda and vary the acid generating component.

12. The examiner maintains the rejections of record for the above reasons.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

14. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee

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pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action.

In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 571-272-1336. The examiner can normally be reached on Monday-Thursday from 8:00 am to 6:30 pm.

16. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F. Huff, can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

17. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Yvette Clarke Thornton
Patent Examiner
Art Unit 1752

yct
April 1, 2004